Summer homework challenge 2017 for physics (all students): **The Boat and the Concrete Block**

There is a boat floating in the middle of a swimming pool.

Inside the boat, there is a heavy concrete block and two strong people.

The block's position inside the boat is below the water line (lower than the surface of the water).

You are standing at the edge of the pool (on the side, not in the water). You kneel down and mark the position of the surface of the water on the side of the pool when the block is in the boat.

The people in the boat then pick-up the block and drop it into the water. There is a huge splash and when the waves have settled, you look down to observe the new level of the water.

What will you find?

The options are;

1. The water is still at the same level as it was before the block was dropped because nothing has really changed – the block was below the level of the surface of the water when it was in the boat and it is below the level of the surface of the water when it is in the water.
2. The water level has gone up because when the block was dropped into the water it had to push some of the water out of the way so that means the overall water level will go up.
3. The water level has gone down.

When you look, you discover that the water level has gone down!

**Questions**

Q1. Did you expect that? Yes / No

Q2. If your answer to Q1 was “no” then state which option you expected and add and any extra information that you can to support your belief. (If you answered “yes” to Q1 then jump to Q3.)

Q3. Explain why the water level has in fact gone down.

Hint: Think about **why** things float and **why** things sink.

If you are totally stuck then you can research this problem online but you must NOT copy-and-paste directly from a website. You must also state the website(s) that you used to find the answer to Q3.

You can print this page and write your answers on this sheet to hand-in to Mr Tarrant at the start of term or you can email your answers to him now (j.tarrant@grainville.sch.je).